

COST GOALS

John Hoag

Jet Propulsion Laboratory

Pasadena, California 91109

Abstract

This paper reports the cost goal activities for the point focusing parabolic dish program. In general, cost goals involve three tasks. First is determination of the value of the dish systems to potential users. Secondly, the cost targets of the dish system are set out. Finally, the value side and cost side are integrated to provide information concerning the potential size of the market for parabolic dishes. This paper reports on the latter two activities.

Introduction

One crucial aspect of technological development is whether or not there will be a market for the technology once it is developed. If there is no market, one reason for development is eliminated. Some view of the potential market is essential. The cost goal exercise attempts to address this question.

There are two aspects to determining whether or not there is a market. First, we have to know what value consumers of the good place on that good. In short, how much would users be willing to pay to obtain the good. Secondly, we need to know something about how much it costs to produce the good. But these pieces by themselves do not yield answers. What if the amount people are willing to pay is lower than the cost, but the number of units people want will not be sufficient to drive the cost that low? In short, some synthesis or integration is required. This paper reports on cost targets and synthesis.

Cost Targets (or Attainability Based on System Cost Targets)

The cost targets are viewed as just that: reasonable targets which can be achieved. There is much challenging technical work to be done toward the achievement of the goals. The goals are initially stated in dollars/square meter for various levels of production. The numbers can then be inverted into other units for easy comparison to the value numbers. In particular, it would be desirable to obtain dollars/unit of output. For the consumer of power, dollar per peak output is not a satisfactory measure since the unit does not always operate at peak. A more desirable measure would be mills/kWh or dollars/MMBTU. To obtain the output (kWh or MMBTU) of the unit, we need to know something about efficiency of the unit of converting sunlight to usable energy and something about insolation. Thus, the cost goals are translated into numbers which are region-specific. The actual cost to the potential user will also depend on what financing arrangements and what unusual tax aspects the user faces. Thus, financial parameters also enter the picture.

Synthesis

These attainability based cost targets need to be integrated with the value base information to see if some potential market size can be determined.

In the following graph, a start toward that synthesis is made. We shall discuss the electric application and similar remarks held for the process heat case.

In this picture, the lines sloping gently upward are the value-based cost goals. The cross hatched areas are the attainability-based numbers. The fact that the attainability-based numbers seem to lie below the value numbers for distillate oil, gas peaking and residual oil seems to suggest that solar power could compete with those fuels. Of course, that would only be true if the utilities used only one kind of fuel, load perfectly matched insolation, if

there are plants of the kind assumed in that region, and if the number of units that people want is large enough to support those costs. In other words, if 10,000-100,000 modules/year are not needed in the 1990-2000 time frame, then there is no way to be sure that these costs can be attained. If that happens, utilities will not find it attractive to utilize solar devices. The point is that value below cost is a necessary condition for success of the solar program, but it is not sufficient.

Since modeling of the subtle economic aspects of the various fuel mixes and load match is very difficult, some case study work is planned to attack these problems. It seems unlikely that insight into these problems will be obtained without such work.

Summary

The size of the market for the device is a matter of considerable interest and importance. The calculation of market size includes both a value based number and an attainability based number. But these numbers by themselves, while necessary, are not sufficient to gauge market success. To correctly understand the nature of the market, finer, more micro studies must be done on a case-by-case basis.

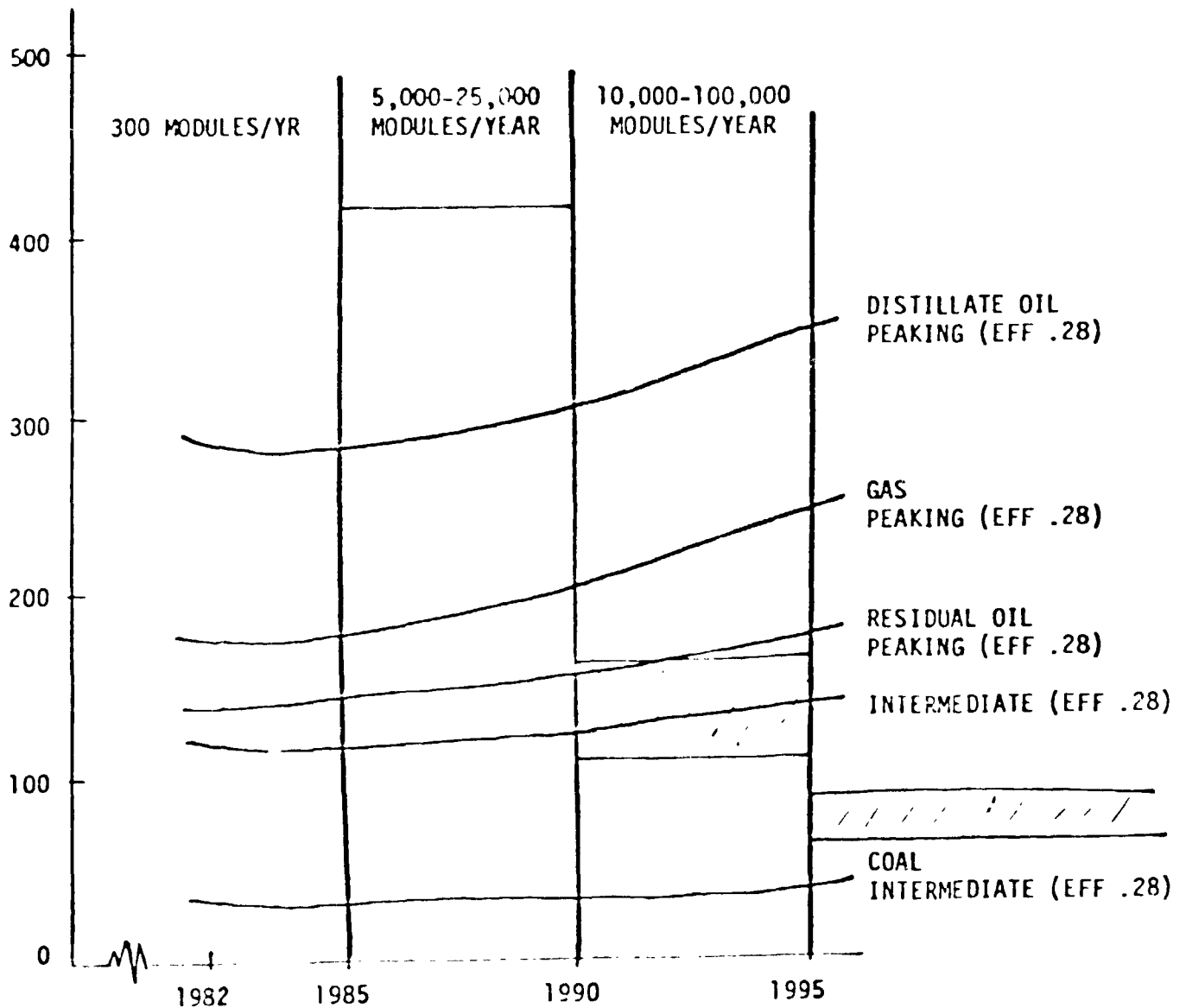
DISH

ELECTRIC UTILITY APPLICATION

BASE CASE

— BASE CASE: ALBUQUERQUE
INVESTOR-OWNED
DRI REAL ESCALATION
FUEL SAVER

LEVELIZED DELIVERED
ENERGY COST
REVENUE RQMTS
(1980 MILLS/KWH)



ON-LINE YEAR